What is claimed is:

1. An apparatus for thermocycling comprising

a small volume reaction vessel;

a remote temperature sensor for monitoring the temperature of a fluid sample inside the reaction vessel; and

a microprocessor operatively associated with the temperature sensor.

2. The apparatus of claim 1, wherein the remote temperature sensor is an optical interferometric sensor.

3. The apparatus of claim 2, further comprising a heating means for heating the reaction vessel and a cooling means for cooling the reaction vessel, both the heating means and cooling means are operatively associated with the microprocessor.

4. The apparatus of claim 3, wherein the heating means is an IR source.

5. The apparatus of claim 4, wherein the IR source is selected from the group consisting of a halogen lamp and a tungsten lamp.

6. The apparatus of claim 4, wherein the IR source is disposed in a spaced relationship with respect to the reaction vessel.

7. The apparatus of claim 3, wherein the cooling means is a compressed air source.

8. The apparatus of claim 7, wherein the compressed air source has means for chilling air.

9. The apparatus of claim 2, wherein the reaction vessel is selected from the group consisting of a capillary tube, a microchip, a microchamber, and a microtiter plate.

10. The apparatus of claim 2, wherein the microprocessor comprises means for effecting DNA amplification in a sample.

11. The apparatus of claim 2, wherein the microprocessor comprises means for converting the frequency output of the EFPI to temperature.

12. The apparatus of claim 2, wherein the small volume vessel holds about 0.4 μL to about 100 μL of the fluid sample.

13. The apparatus of claim 2, wherein the optical interferometric sensor is an extrinsic Fabry-Perot interferometer (EFPI).

14. A temperature sensor for sensing the temperature of a small volume solution comprising

an optical interferometric sensor; and

a support system associated with the optical interferometric sensor for displaying the out put of the optical interferometric sensor.

15. The temperature sensor of claim 14, wherein the small volume solution is from about 100 pL to about 100 μL.

16. The temperature sensor of claim 14, further comprising a microprocessor for receiving signals from the support system and converting the signals into a temperature of the small volume solution.

17. The temperature sensor of claim 14, wherein the support system is a spectrophotometer.

18. The temperature sensor of claim 14, wherein the optical interferometric sensor is an extrinsic Fabry-Perot interferometer (EFPI).

19. A method for measuring the temperature of a small volume solution comprising the steps of:

providing an optical interferometric sensor;

providing a small volume of a sample;

interrogating the small volume with the optical interferometric sensor to obtain an output; and

converting the output of the optical interferometric sensor to temperature using a calibration curve.

20. The method of claim 19, wherein the small volume of a sample is contained in a capillary tube, a microchip, a microchamber, or a microtiter plate.

21. The method of claim 19, wherein the calibration curve is obtained by interrogating samples with known temperatures using the optical interferometric sensor.

22. The method of claim 19, wherein the converting step is accomplished by a microprocessor.

23. The method of claim 19, wherein the small volume is about 0.4 μL to about 100 μL.

24. The method of claim 19, wherein the optical interferometric sensor is an extrinsic Fabry-Perot interferometer (EFPI).